

# **M th d for Improving th Depth of Field and Resolution of Microscopy**

## **ABSTRACT OF THE INVENTION**

**[0048]** This invention is about a microscopic technology for improving depth of field and resolution by obverse and opposite scanning and 3D image combination. According to the above-mentioned design, the thickness of the three-dimensional image can be increased, and the image resolution and the depth of field can be improved. After fixing a sample in 3D space with embedding gel, the obverse and opposite scanning are performed to the sample, and the images obtained from the mentioned scanning are combined to achieve the 3D microscopic image with the deeper depth of field. The mentioned 3D image combination comprises the application of fast Fourier Transferring, Sobel edge checking, and relative matching to determine the overlapping position of the obverse and the opposite scanning images on Z axial. After finding out the shift on X Y plane and the rotation pivoted with Z axial by fast Fourier Transferring theory, the upper and the lower images are adjusted, and a complete 3D image is achieved.